Tubes coated with gold and with p-xylylene polymer for tests in a vertical tube still at the Wrightsville Beach Test Facility of the Office of Saline Water

velocities, presence of non-condensable gases, etc.)—to be used as inputs for design of systems to utilise the dropwise condensation.

(2) Design of plants, small and large, specifically for dropwise condensation; for example, with high coolant velocities and with special provisions for preventing contamination (e.g., plastic linings for steel shells).

(3) Development of automated electrodeposition processes for quantities of very long tubes, for example, 20 metres.

(4) Operating prototype plants with gold-plated tubes for a number of years to establish the proven reliability of performance needed for commercial use.

We have in dropwise condensation a new and different use for gold, one which should some day have great usefulness in the area of heat transfer. To bring it from the laboratory scale to large-scale application will require much additional effort, but this effort should be rewarded with a significant advance in technology—one which is based on the unique properties of gold.

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Laser-modified Gold Films

Intense laser beams may damage optical instruments if they are not protected from the radiation. A protective technique in which thin gold films were vapour deposited on to quartz blanks has been investigated by P. D. Poulsen of General Dynamics, San Diego, California (*Appl. Optics*, 1972, **11**, (4), 949). Coatings with about 30 per cent peak transmittance at 0.5 μm were able to withstand 10.6 μm radiation from an 80 watt carbon dioxide laser focused on to a 3 mm spot (1.2 kW/cm^2) for several minutes, whereas an unprotected quartz surface was damaged in less than one second.

Furthermore, the reflectance was improved by this irradiation, presumably by melting of surface gold particles to form a smooth surface. At the same time the transmittance was also increased in the visible region. When the gold film was removed from the quartz, both adherence and apparent hardness of the coating were found to have been enhanced by the irradiation. However, thicker opaque gold films did not show such enhanced reflectance.